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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/663,786 | 09/17/2003 | Shigeru Kuramoto | 242926US0 | 2975 |

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT PAPER NUMBER

1742

DATE MAILED: 12/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,786

Applicant(s)

KURAMOTO ET AL.

Examiner

Jessee Roe

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-11 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11, and 13-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-5, 11, 13-18 remain for examination wherein claim 1 is amended; claims 6 and 12 are canceled; and claims 15-18 are new.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 September 2006 has been entered.

Status of Prior Rejections

The prior rejection of claims 1-5, 11 and 13-14 under 35 U.S.C. 103(a) as being unpatentable over Yoshimura (JP 05-279773) is withdrawn in view of the Applicant's arguments.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 11, 13, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bitter et al. (GB 2,190,100).

In regards to claims 1, 2, 11, 13, and 15-17, Bitter et al. ('100) disclose a titanium-based alloy that may contain 3%-28% of any one or more of the following elements: molybdenum, hafnium, zirconium, manganese, tin, boron, vanadium, tungsten, niobium, tantalum, iron, carbon, oxygen, chromium, nickel, cobalt, copper, and aluminum (abstract) (which overlaps the claimed 0.6-3% carbon and oxygen content). For example, combining 3% molybdenum with 3% vanadium would provide a Mo_{eq} of 5 based on the Mo_{eq} equation provided by the Applicant. The alloy may be in the form of α , β , or $\alpha+\beta$ (pg. 1, lines 1-20). The interstitial solution element may contain carbon, nitrogen, or oxygen (pg. 2, lines 1-20).

The Examiner notes that the overlapping ranges establishes a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one skilled in the art to select the claimed carbon and oxygen content over Bitter et al. ('100) because Bitter et al. ('100) teaches the same utility (titanium alloys for machines).

In regards to claims 3 and 5, Bitter et al. ('100) does not disclose the Young's modulus and the elastic deformability for all possible chemical compositions. However, the Young's modulus and elastic deformability would be met by the inherent material properties of a titanium-based alloy consisting of any one or more of following elements: molybdenum, vanadium, tungsten, niobium, tantalum, iron, carbon, oxygen, chromium, nickel, cobalt, copper, and aluminum. See MPEP 2112.01 I.

In regards to claim 4, Bitter et al. ('100) disclose that the tensile strength is at

least 640 N/mm² (MPa) (claim 1) (which overlaps the claimed 1,000 MPa or greater tensile strength). The Examiner notes that the overlapping ranges establishes a prima facie case of obviousness. See MPEP 2144.05 I.

Claims 1-5, 11, and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,607,693).

In regards to claim 1, 2, 11 and 13-18, Saito et al. ('693) disclose a titanium-based alloy with 30%-60% by weight (mass) of a Va Group element (vanadium, niobium, and tantalum) (col. 5, lines 40-60). If the element is niobium and is present in an amount of 30%, Mo_{eq} would be 8.4%, which is well within the 3%-11% by mass (weight) Mo_{eq} (claims 1 & 15) and the 3.5%-10.5% by mass (weight) Mo_{eq} (claim 16). The titanium-based alloy would contain between 0.05%-1.0% weight (mass) carbon (which overlaps the 0.6%-3.0% by mass of carbon (claims 1 & 15) and the 0.7%-3.0% by mass (claims 13 & 17)); 0.05%-0.8% weight (mass) nitrogen (which overlaps the 0.6%-3.0% by mass of nitrogen (claims 1 & 15) and the 0.7%-3.0% by mass of nitrogen (claims 13 & 17)); 0.05%-0.6% weight (mass) oxygen (which overlap the 0.6%-3.0% by mass oxygen (claims 1 & 15)) ; and 0.3-5% by weight (mass) aluminum(which overlaps the 1.8% by mass or less of aluminum (claims 1 & 15) and the 0.3%-1.7% of aluminum (claims 14 & 18)) (col. 10, lines 35-65). The alloy would be a β alloy (col. 4, lines 35-65) (claims 1 & 15). The titanium alloy would also contain 20% or less weight (mass) of zirconium, hafnium, and scandium (col. 9, lines 1-30) (which overlaps the 0.1%-10% mass (weight) of claim 15).

The Examiner notes that the overlapping ranges establishes a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one skilled in the art to select the claimed carbon, oxygen, nitrogen, aluminum, zirconium, hafnium, and scandium compositions over Saito et al. ('693) because Saito et al. ('693) teaches the same utility (titanium alloys for machines).

In regards to claim 3 and 4, Saito et al. ('693) disclose that the titanium-based alloy would have a Young's modulus that would be 70 GPa or less and the tensile strength that would be 900 MPa or more (which overlaps the tensile strength of 1,000 MPa or more) (col. 5, lines 1-10). The Examiner notes that the overlapping ranges establishes a prima facie case of obviousness. See MPEP 2144.05 I.

In regards to claim 5, Saito et al. ('693) does not disclose the elastic deformability for all possible chemical compositions. However, the elastic deformability of 1.6% or more would be met by the inherent material properties of the titanium-based alloy. See MPEP 2112.01 I.

Claims 1-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmed (US 5,871,595)

Claims 1-5 and 11 are rejected on the same grounds as stated in the Office Action of 23 May 2006.

In regards to the amended feature of claim 1, oxygen, nitrogen, and carbon are performing the same function, interstitial elements. Therefore oxygen, nitrogen, and carbon are functional equivalents See MPEP 2144.06

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1-5 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 5-6, and 26 of US Patent No.

6,607,693. Although the conflicting claims are not identical, they are not patentably distinct from each other because: At claim 1 of US Patent No. 6,607,693, a titanium alloy is characterized by 30%-60% of a Va Group element (vanadium, niobium, and tantalum). If the element is niobium and is present in an amount of 30%, Mo_{eq} would be 8.4%, which is well within the 3%-11% by mass (weight) Mo_{eq} of instant claim 1. At claim 2 of US Patent No. 6,607,693, aluminum is added in an amount of 0.3%-5% by weight (mass), which overlaps the 1.8% by mass or less aluminum limitation of instant claim 1. At claim 5 of US Patent No. 6,607,693, oxygen is present (as in instant claim 2)

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in an amount of 0.08%-0.6% by weight (mass), which overlaps the 0.6%-3% by mass (weight) of instant claim 1. At claim 6 of US Patent No. 6,607,693, nitrogen and carbon are present in an amount of 0.05-0.8% by weight (mass) and 0.05-1% by weight (mass). Vanadium, niobium, molybdenum, and tantalum are beta stabilizers. At claim 26 of US Patent No. 6,607,693, if niobium, molybdenum, or tantalum is added in a large quantity (30-60% by mass or weight) and sintered, then the microstructure would be beta phase when cooled to room temperature. In regards to a Young's Modulus of 70 GPa or less (claim 3), a tensile strength of 1,000 MPa or more (claim 4), and an elastic deformability of 1.6% or more (claim 5), these properties would be inherent in the titanium-based alloy of claims 1-2, 5-6, and 26 of US Patent No. 6,607,693. See MPEP 2112.01 I.

Response to Arguments

Applicant's arguments filed 25 September 2006 have been fully considered but they are not persuasive.

The Applicant argues that Ahmed et al. do not suggest that a β phase alloy would result. The Examiner disagrees. One of ordinary skill in the art of titanium alloy would know that niobium and tantalum are beta stabilizers. Therefore, adding niobium and tantalum in amounts of up to 52% (abstract of Ahmed et al. (US 5,871,595)) would more likely result in a β phase alloy than not.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR


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